C. C. BRADBURY.

PARTY LINE INDICATING KEY.

APPLICATION FILED AUG. 3, 1907.

899,024.

Patented Sept. 22, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

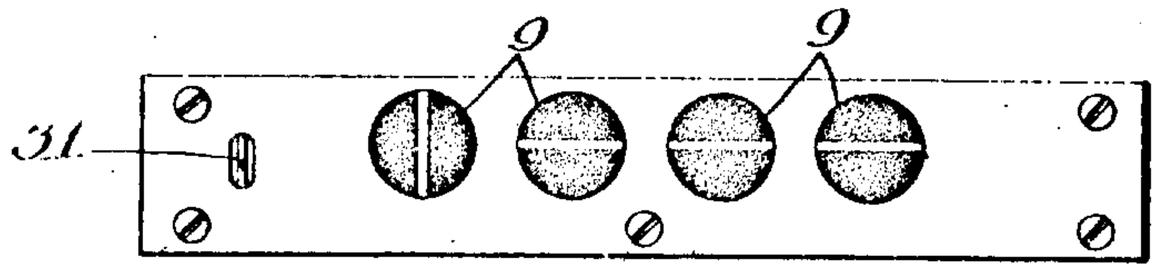


Fig. 2.

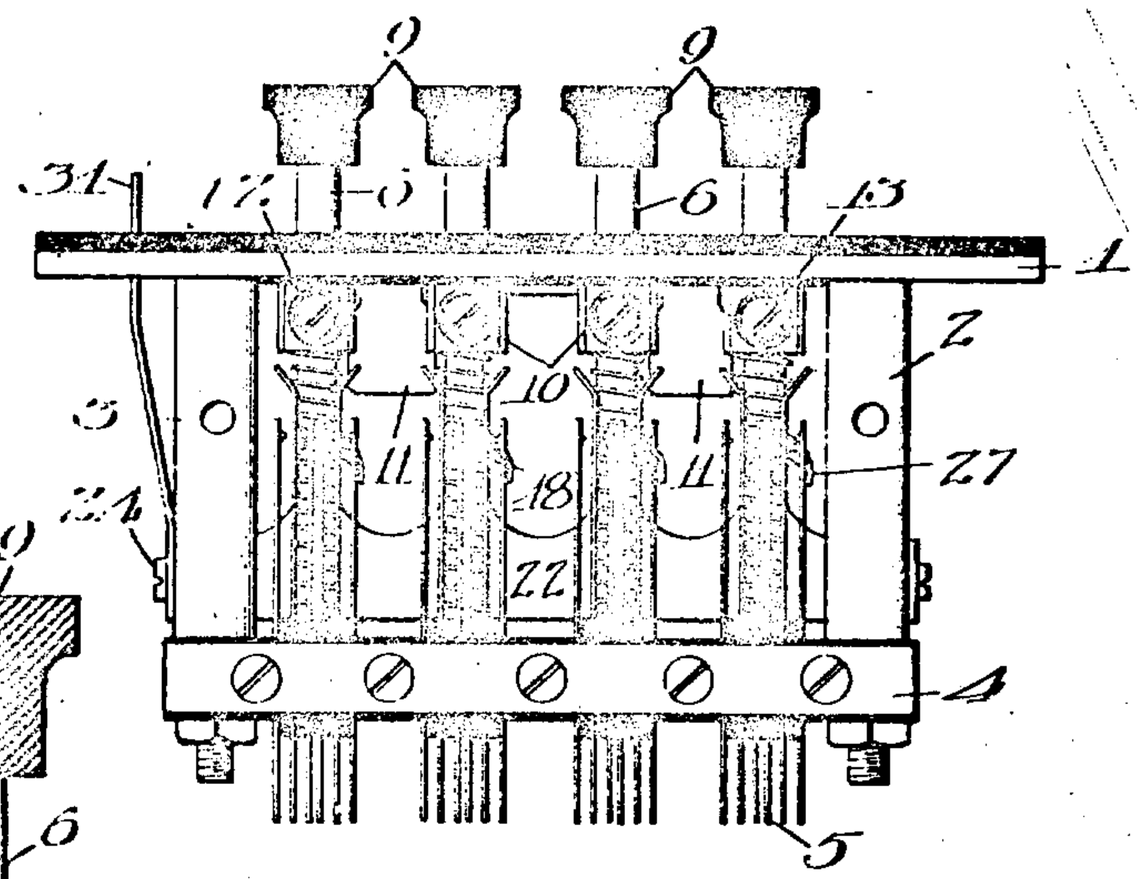


Fig. 3.

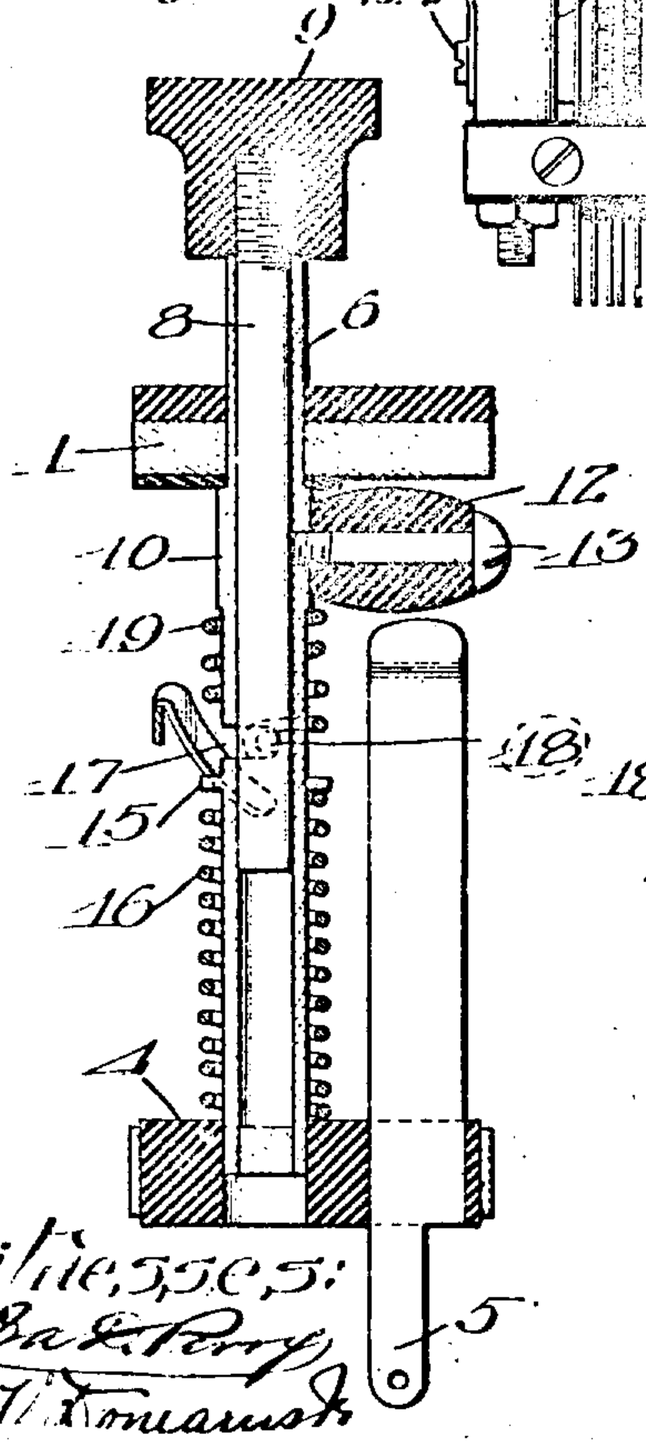


Fig. 4.

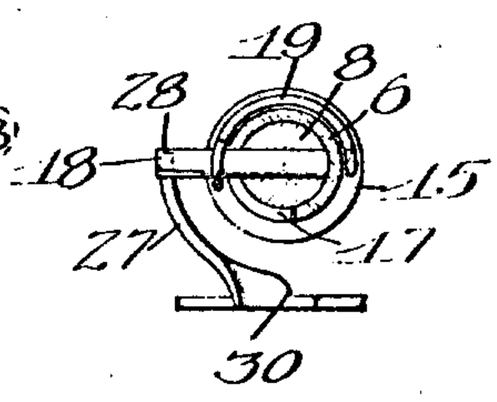
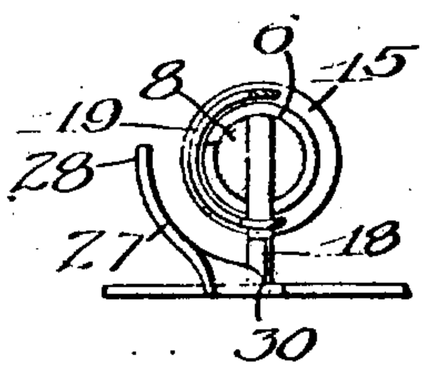


Fig. 5.



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2 SHEETS—SHEET 2.

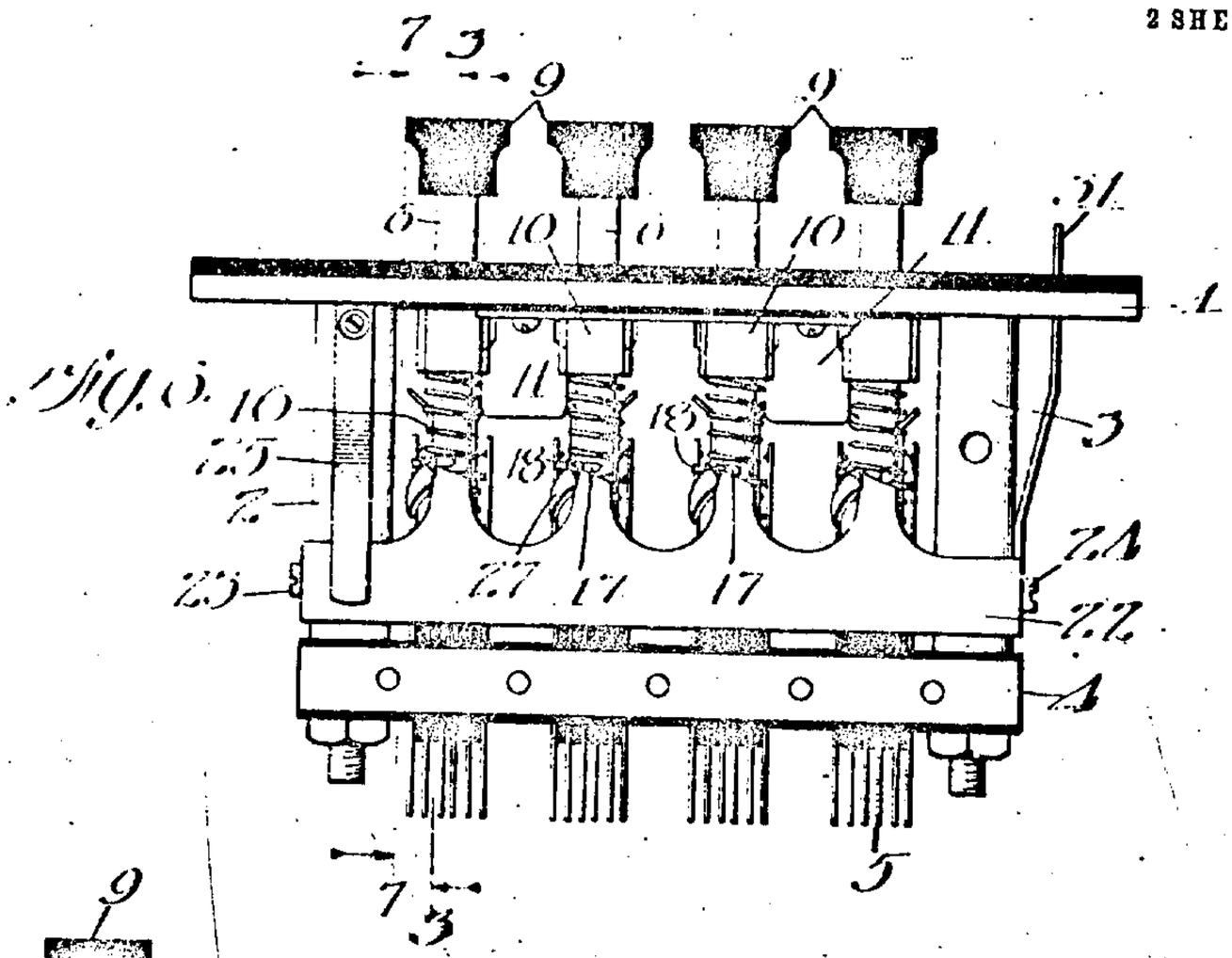


Fig. 7

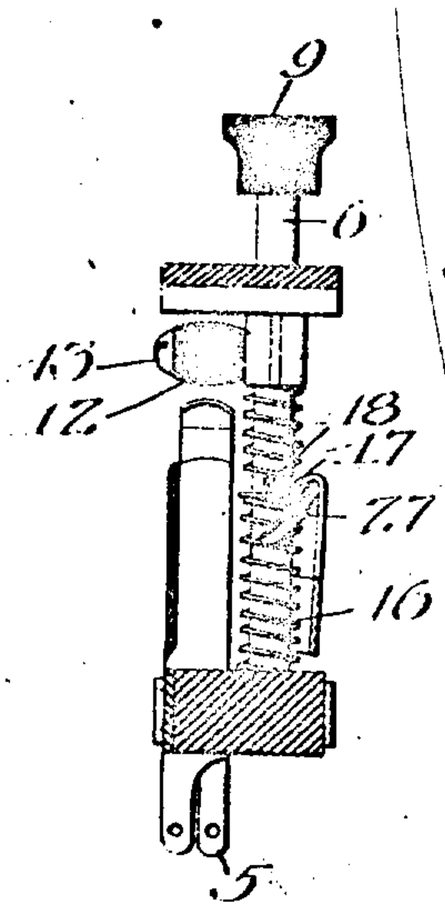


Fig. 8.

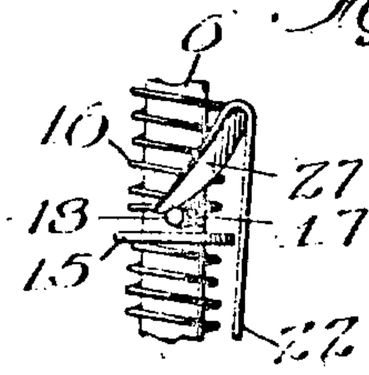


Fig. 9.

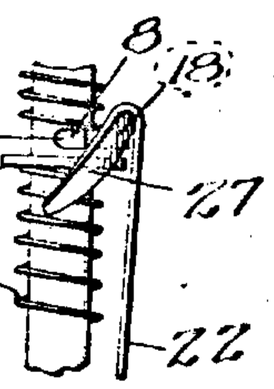
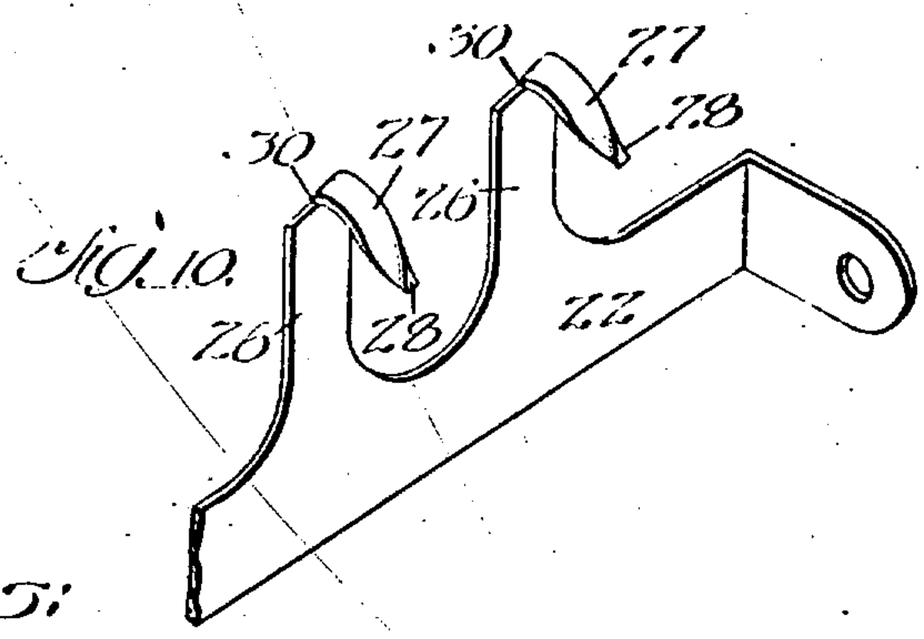


Fig. 10.



Witnesses:
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Inventor:
Clifford C. Bradbury:
By: Curtis Bell Campbell
Attys:

UNITED STATES PATENT OFFICE.

CLIFFORD C. BRADBURY, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PARTY-LINE-INDICATING KEY.

No. 899,024. Specification of Letters Patent. Patented Sept. 22, 1908.

Application filed August 3, 1907. Serial No. 386,897.

To all whom it may concern:

Be it known that I, CLIFFORD C. BRADBURY, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Party-Line-Indicating Keys, of which the following is a specification.

My invention relates to party line ringing keys for telephone systems, and especially to that class of ringing keys known as indicating keys.

One object of my invention is to provide a key which shall give ready and positive indication to the operator which of the buttons of the key was last depressed.

Another object is to provide a key inexpensive to manufacture and durable and efficient in operation.

Still further objects will appear from the following description and claims.

In carrying out my invention, I preferably provide the upper or flat surface of each of the buttons with a white line and arrange the mechanical structure of the device such that the last button depressed rotates one-fourth of the way round in its return from actuating to unactuating position and remains in its rotated position with the white line standing at right angles to its normal position until another button is depressed. By this arrangement the operator if requested to ring a second time on a telephone party line can by a single glance at the indicating key observe which of the keys was last depressed, thereby saving the annoyance of inquiring of the calling subscriber which of the parties on the line was desired.

My invention is illustrated in the accompanying drawing in which

Figure 1 is a plan view showing one of the buttons in its indicating position; Fig. 2 is a front elevation; Fig. 3 is a longitudinal section through one of the plungers taken on the line 3—3 of Fig. 6; Fig. 4 is a right section of one of the plungers as it appears when the button is in its non-indicating position; Fig. 5 is a right section of one of the plungers as it appears when the button is in its indicating position; Fig. 6 is a rear elevation of the device; Fig. 7 is a section of the key taken on line 7—7 of Fig. 6; Fig. 8 shows the rotating cam when the plunger is in its depressed position; Fig. 9 shows the rotating cam when the plunger is in its released and indicating position, and Fig. 10 is an isometric view of a portion of the plate carrying the rotating cams.

The key here illustrated as embodying my invention comprises the supporting frame having the metallic top plate 1 to which are secured the connecting pillars 2 and 3 for the purpose of supporting the rubber insulating strip 4 which carries the switch springs 5. Four vertically reciprocating plungers 6 pass through alined openings in the top plate 1 and switch spring support 4. Within these hollow cylindrical plungers 6 are the rods 8 carrying the buttons 9 preferably tightly threaded on the extending ends of the rods. Each of these tubular plungers 6 carries an enlargement 10 slotted on each side to engage the guide plates 11 to prevent the rotation of the plungers 6. Upon this enlargement is carried the rubber knob 12 for actuating the switch springs, this knob being secured to the plunger by means of the screw 13 such that the depression of the plunger forces the knob between the sloping ends of the long switch springs and deflects these springs to change their contact from normal to actuating position. At a point on plunger 6 some distance below the enlargement 10 is the collar 15 against which the coil spring 16 abuts to hold the plunger normally in its uppermost position. Slightly above this collar 15 is a slot 17 extending through the wall of the plunger 6, through which the pin 18 projects, this pin being securely held in a hole in the rod 8. The extending end of the pin 18 is engaged by the lower end of the coil spring 19, this spring being under torsional compression such that it tends to hold the pin 18 in the position in the slot 17 indicated in Fig. 4.

Pivoted between posts 2 and 3 is a cam plate 22 shown particularly in Fig. 10. This plate is adapted to rock slightly upon the screws 23 and 24 and is normally held with the upper portion of the plates pressed inwardly by the spring 25. This plate 22 has four prongs 26, one adapted to register with each of the vertically reciprocating plungers. The upper end of each of these prongs is turned inwardly and is twisted to form the cams 27.

When the key button is depressed the pin 18 engages the point of cam 27 on the surface indicated by 28 of Fig. 10. This rocks the plate with its four cams outwardly until the pin 18 passes the lower point of the cam.

The plate 22 with its four cams is then forced in by the spring 25 such that on the return stroke the pin 18 engages the cam upon the face opposite 28 as shown in Fig. 8. The action of the cam surface upon the pin 18 in the upward movement of the plunger rotates the inner rod and button such that when the plunger reaches its uppermost position the pin 18 has been moved against the pressure of the spring 19 to the position in the slot 15, at right angles to its normal position. When in this position the end of the pin abuts the surface of the cam indicated by 30 in Fig. 10 and the pin assumes the position shown in Fig. 5. When any other key is depressed and the plate is again rocked outwardly by the action of another pin on the face 28 of cam 27 the pin which was formerly engaged by the face 30 of one of the cams, is released by the movement of the plate, allowing the spring 19 to rotate the rod and button back to their normal positions.

The plate 22 is provided with the extended finger 31 which passes through the slot 32 in the top plate so that if it is desired, the operator may at any time release the last button depressed from its indicating position without depressing another button. This provision is not necessary unless all four of the buttons are simultaneously depressed, in which case they will all assume the indicating position and there will be no other means than the finger 31 for again releasing them. It is to be understood that this indicating feature may be used with any selective signaling system, and that the arrangement of contact springs shown is not essentially a feature of my invention, it being possible to use any other combination of switch springs without departing from the spirit or scope of my invention.

What I claim is:

1. In an operator's indicating key, a plurality of switch actuating buttons, each button having a normal unactuating position, a depressed actuating position and a partially rotated unactuating indicating position, substantially as described.

2. In an operator's indicating key, the combination with a suitable frame, of a plurality of reciprocating switch actuating betons supported by the frame, each button being adapted to rotate to an indicating position after it has been depressed and released, substantially as described.

3. In an operator's indicating key, the combination with a plurality of sets of switch springs, of a vertically reciprocating button for actuating each set, and means to indicate the last button depressed by the angular position of the buttons upon their reciprocating axis, substantially as described.

4. In an operator's indicating key, the combination with a plurality of sets of switch springs, of a plurality of actuating buttons, one for each set of springs, each button having a reciprocating movement for the actuation of the springs and a rotary movement for indicating purposes, substantially as described.

5. In an operator's indicating key, the combination with a plurality of sets of switch springs, a plurality of buttons, each adapted to be depressed to individually actuate its associated set of switch springs, said buttons having normally a symmetrical appearance, and means to rotate the button last depressed out of its symmetrical position with respect to the other buttons, substantially as described.

6. In an operator's indicating key, the combination with a plurality of sets of switch springs, of a plurality of actuating buttons, one for each set of springs, said buttons having reciprocating and rotating movement, means to partially rotate the last button depressed and released, and means to restore the rotated button to normal position when another button is depressed, substantially as described.

7. In an operator's indicating key, the combination with a suitable frame, of a plurality of sets of switch springs mounted therein, a plurality of actuating plungers, one for each of said switch springs, a button for each plunger, means for actuating the switch springs when the associated button is depressed, means for rotating the button about its reciprocating axis when the button is released, and means to restore the button to its normal position when any other button is depressed to its actuating position, substantially as described.

8. In an operater's indicating key, the combination with a suitable frame, of a plurality of reciprocating actuating plungers mounted in said frame, an auxiliary plunger carried within each of said actuating plungers, a button carried upon the end of the auxiliary plunger, a projection upon each of the auxiliary plungers extending through a slot in the actuating plunger, a cam surface adapted to be engaged by each of said projections to rotate the auxiliary plunger and button when the actuating plunger is depressed and released, a pivoted plate carrying said cam surfaces, and means to tilt the plate upon its pivots when an actuating plunger is depressed, whereby the last rotated plunger is released, and a spring to restore the auxiliary plunger to its normal position, substantially as described.

9. In an operator's indicating key, the combination with a suitable frame, of a plurality of plungers mounted in said frame, a plurality of cams, one associated with each of said plungers, a pivoted plate carrying said cams, a spring for holding the plunger normally in its uppermost position, means carried by the plunger for engaging its associ-

ated cam when the plunger is depressed to its lower position, said means being engaged by the surface of the cam to rotate the plunger as the plunger returns to its uppermost position, said means being engaged by the cam to maintain the plunger in its rotated position after the plunger has reached its uppermost position, the pivoted plate and its cams being moved by the depression of any other plunger, whereby the engaging means is released and the plunger is restored to its normal position, substantially as described.

10. In an operator's indicating key, the combination with a plurality of switch actuating buttons, of means to indicate the last button depressed and released to its normal height by the external appearance of the button itself, substantially as described.

Signed by me at Chicago, county of Cook, and State of Illinois, in the presence of two witnesses.

CLIFFORD C. BRADBURY.

Witnesses:
MARJORIE E. GRIER.
EDITH F. GRIER.